20. (New) The method, as recited in claim 12, further comprising stripping a photoresist mask, comprising:

stopping the flow of C4F8 and CF4 into the reaction chamber, after etching through the etch stop layer;

providing a flow of nitrogen into the reaction chamber; and

generating a plasma in the reaction chamber.

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21. (New) The method, as recited in claim 6, further comprising stripping a photoresist mask, comprising:

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stopping the flow of C4F8 and CF4 into the reaction chamber, after etching through the etch stop layer;

providing a flow of nitrogen into the reaction chamber; and

generating a plasma in the reaction chamber.

REMARKS

Claims 1, 4, 5, 7, and 10-14 have been amended. Claims 2, 3, 8, 9, and 19 have been cancelled. Claims 20 and 21 have been added. Claim 1 has been amended to incorporate the limitations of claims 2 and 3. Claim 7 has been amended to incorporate the limitations of claims 8 and 9.

The Examiner rejected claims 1 and 7 under 35 U.S.C. 102(b) as being anticipated by Hung et al. (US 6,387,287 B1). The Examiner rejected claims 2-5 and 8-10 under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (US 6,387,287 B1).

Claims 1 and 7 have been amended to recited that the etchant gas mixture comprises C4F8, CH2F2, oxygen, and CF4. Although Hung teaches etching through an organosilicate glass by teaching etching through a TEOS oxide ARC using a C4F8, CF4 and Ar etchant, Hung does not discloses or make obvious etching a feature in an organosilicate glass or etching through the organosilicate glass layer using an etchant gas mixture of C4F8, CH2F2, oxygen, and CF4, as recited in claims 1 and 7, as amended. Although Hung teaches that CH2F2 and O2 are useful for providing greater oxide to nitride selectivity, nothing in Hung would suggest that

the addition of CH2F2 and O2 would provide a greater organosilicate glass to nitride selectivity. Organosilicate glass, oxide, and nitride etch differently when exposed to an etch chemistry. Just because a chemistry may be successful for selectively etching an oxide does not mean that the same chemistry would be successful for selectively etching an organosilicate glass. For at least these reasons, claims 1 and 7, as amended, are not anticipated or made obvious by Hung.

Claims 2, 3, 8, and 9 have been cancelled. Claims 4, 5, and 10 are dependent on claims 1 and 7, and for at least this reason, are not made obvious by Hung.

The Examiner rejected claims 6 and 11-13 under 35 U.S.C. 103(a) as being unpatentable over Hung as applied to claims 1-5, 7-10 above and further in view of Chiang et al. (US 5,739,579) and Wolf et al. (Volume 1, pp 556). Claims 6 and 11-13 are ultimately dependent on claims 1 or 7, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claims 1 and 7. Additionally, these dependent claims require additional elements that, when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claims 6, 11, and 12 further recite the stopping the flow of C4F8 and CH2F2 to selectively etch through the etch stop. Although Wolfe et al. does disclose that a plasma etchant of CF4 and O2 may be used to etch Si3N4, Wolfe et al. does not suggest or make obvious that such a plasma etchant would successfully selectively etch Si3N4 with respect to organosilicate glass. For at least these reasons, claims 6 and 11-13 are not made obvious by the cited references.

The Examiner rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Hung et al., Chang, and Wolf et al. as applied to claims 1-13 above in view of Li et al. (US 6,284,149 B1). Claim 14 and new claims 20 are ultimately dependent on claim 7, and claim 21 is dependent on claim 6, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claims 6 and 7. Additionally, these dependent claims require additional elements of stripping after etching through either the etch stop of second OSG layer, which when taken in the context of the claimed invention, further patentably distinguish the art of record. Li teaches a stripping process that is used for the main etch, since the step of Li etches and strips at the same time. Therefore, Li does not teach or suggest a stripping done after the main etch. For at least these reasons, claims 14, 20, and 21 are not made obvious by the cited references.

In view of the above, it is respectfully submitted that the application is in a condition for allowance and action to that effect is respectfully requested at an early date. If the Examiner

feels that a telephone conference would expedite allowance of this application, the Examiner is invited to call the undersigned at (831) 655-2300.

The Commissioner is authorized to charge any fees that may be due to our Deposit Account No. 50-0388 (Order No. LAM1P154).

Respectfully submitted,

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CLEAN VERSION OF PENDING CLAIMS

1. (Twice Amended) A method for etching a feature in an integrated circuit wafer incorporating at least one layer of organosilicate glass dielectric, the method comprising:

positioning the wafer in a reaction chamber;

introducing a flow of etchant gas mixture including C4F8, CH2F2, oxygen, and CF4 into the reaction chamber;

striking a plasma with the etchant gas in the reaction chamber; and

etching the at least one layer of organosilicate glass with the plasma from the etchant gas.

2. (Cancelled).

3. (Cancelled).

4. (Once Amended) The method, as recited in claim 1, wherein the etchant gas mixture further comprises argon.

5. (Once Amended) The method, as recited in claim 4, wherein the at least one layer of organosilicate glass is a first layer of organosilicate glass dielectric, which is etched with the plasma from the etchant gas comprising C4F8, CF4, CH2F2, oxygen and argon.

6. The method, as recited in claim 5, further comprising stopping the flow of CH2F2 and C4F8 in the etchant gas and using the resulting plasma to etch through an etch stop layer.

7. (Twice Amended) A method for etching a feature in an integrated circuit wafer, the method comprising:

positioning the wafer in a reaction chamber;

etching through a first layer of organosilicate glass dielectric, comprising:

providing a flow of an etchant gas mixture including C4F8, CH2F2, oxygen, and CF4 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

8. (Cancelled).

9. (Cancelled).

10. (Once Amended) The method, as recited in claim 7, wherein the etchant gas mixture for etching through the first layer of organosilicate glass, further comprises argon.

11. (Once Amended) The method, as recited in claim 10, further comprising etching through an etch stop layer, comprising:

providing an etchant gas mixture without C4F8 and CH2F2 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

12. (Once Amended) The method, as recited in claim 10, further comprising etching through an etch stop layer after etching through the first layer of organosilicate glass, comprising:

stopping the flow of C4F8 and CH2F2 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

13. (Once Amended) The method, as recited in claim 12, further comprising etching through a second layer of organosilicate glass dielectric, comprising:

restarting the flow of C4F8 and CH2F2 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

14. (Once Amended) The method, as recited in claim 13, further comprising stripping a photoresist mask, comprising:

stopping the flow of C4F8 and CF4 into the reaction chamber, after etching through the second layer of organosilicate glass;

providing a flow of nitrogen into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

15. An integrated circuit formed by the method comprising:

positioning a wafer in a reaction chamber;

etching through a first layer of organosilicate glass dielectric over the wafer, comprising:

providing a flow of an etchant gas mixture including C4F8 and CF4 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

16. The integrated circuit, as recited in claim 15, wherein the etchant gas mixture for etching through the first layer of organosilicate glass, further comprises CH2F2, oxygen, and argon.

17. The integrated circuit, as recited in claim 16, wherein the method further comprises etching through an etch stop layer, comprising:

providing an etchant gas mixture without C4F8 and CF4 into the reaction chamber; and

generating a plasma with the etchant gas in the reaction chamber.

18. The integrated circuit, as recited in claim 16, wherein the method further comprises etching through an etch stop layer after etching through the first layer of organosilicate glass, comprising:

stopping the flow of C4F8 and CF4 into the reaction chamber; and

generating a plasma with the resulting etchant gas in the reaction chamber.

19. (Cancelled).

20. (New) The method, as recited in claim 12, further comprising stripping a photoresist mask, comprising:

stopping the flow of C4F8 and CF4 into the reaction chamber, after etching through the etch stop layer;

providing a flow of nitrogen into the reaction chamber; and

generating a plasma in the reaction chamber.

21. (New) The method, as recited in claim 6, further comprising stripping a photoresist mask, comprising:

stopping the flow of C4F8 and CF4 into the reaction chamber, after etching through the etch stop layer;

providing a flow of nitrogen into the reaction chamber; and

generating a plasma in the reaction chamber.